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09/770,017	01/25/2001	Masayoshi Kobayashi	P/2291-98	5189

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EXAMINER

NGUYEN, TAM V

ART UNIT

PAPER NUMBER

2172

DATE MAILED: 09/09/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/770,017

Applicant(s)

KOBAYASHI, MASAYOSHI

Examiner

Tam V Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. Applicant's arguments filed 7/2/03 have been fully considered but they are not persuasive.
2. Applicant's canceled claims 1-5 and the added of new claims 24-29 have been reviewed and discussed in the following rejection. The pending claims 6-29.

Response to Arguments

The applicant's argued that there is no teaching of forming an assumed tree structure in which all the items of data are store.

In response, the examiner respectfully disagrees with the argument above because Ahn discloses the group 202 is a tree data structure that is used to locate entries in the group index table 204 associated with particular search key, (col. 2, lines 56-58). Thus, the Ahn tree is considered as step of ***forming an assumed tree structure***. The group binary tree 202 includes a node for each searchable term in the documents D1-D4 of Group A, (col. 2, lines 61-62). In other word, Ahn's technique as discussed indicates the step of all the items of data are stored.

The applicant's argued that there is no teaching of sequentially selecting a node form the assumed tree structure to select a sub-tree structure designated by the selected node.

In response, the examiner respectfully disagrees with the argument above because Ahn discloses the search begins at the root node of the group tree 202, which

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is "maybe" node. if the value of this node is equal to the keyword, then the search is complete. If the value of this node is greater than the keyword, the left branch is taken. If the value of this node is less than the keyword, then the right branch is taken, (col. 3, lines 10-15, (col. 3, lines 10-15). In other words, the sequentially selection of sub-trees beginning with the highest order sub-trees to lower-order sub-trees. Therefore, Ahn's technique as discussed indicates as ***sequentially selecting a node from the assumed tree structure to select a sub-tree structure designated by the selected node.***

The applicant's argued that there is no teaching of forming an equivalent table storing a portion of the items of data corresponding to the selected sub-tree structure in a table form.

In response, the examiner respectfully disagrees with the argument above because Ahn discloses the group index table 204 includes an entry 205 for each occurrence of each searchable term in the documents D1-D4 of Group A, (col. 2, lines 33-36). In other words, Ahn's technique as discussed indicates the step of ***forming an equivalent table storing a portion of the items of data corresponding to the selected sub-tree structure in a table form.***

The applicant's argue that there is no teaching of replacement the selected sub-tree structure with the equivalent table to the construct the data structure.

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In response, the examiner respectfully disagrees with the argument above because Ahn discloses the "glass" node stores three pointers 250 to the group index table 204. These pointers 250 identify the entries in the group index table 203 that are associated with the keyword "glass", (col. 3, lines 19-23). In other words, Ahn's technique as discussed indicates the step of ***replacement the selected sub-tree structure with the equivalent table to the construct the data structure.***

Claim Objections

3. Claim 7 is objected to because of the following informalities: the phrase "to claim 6 24" on line 1 is not clear. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn (US 5848409).

As to claims 6 and 21, Ahn discloses a forming an assumed tree structure in which all the items of data are stored, (col. 2, lines 56-60); sequentially selecting a node from the assumed tree structure to select a sub-tree structure designated by the

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selected node, (col. 2, lines 56-60); determining whether the elected sub-tree structure satisfies the following conditions; and when the selected sub-tree structure satisfies the condition, replacing the selected sub-tree structure with the equivalent table to construct the data structure, (col. 2, lines 65-col. 3, lines 4). Ahn discloses a group tree contain plurality of nodes pointer to group index table; however, Ahn does not clearly teach "forming an equivalent table storing a portion of the items of data corresponding to the selected sub-tree structure in a table form". Ahn shows each node has a value and two branches, where the left branch is less than the value, and the right branch is greater than the value. Each node also stores one or more pointers to the group index table 204, (col. 2, lines 65-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the group index table taught in Ahn, so the system is capable of searching through individual documents, or groups of documents, and the system can locate one or more hit entries in a group hits table associated with a keyword in a search request.

As to claims 7, 10, 14, and 22, Ahn further discloses the condition (1) is that, when the selected sub-tree structure is replaced with the equivalent table to form a new data structure, a maximum search time T_{max_t} calculated from the new data structure does not exceed a maximum search time T_{max} calculated from the assumed tree structure, (col. 2, lines 65-col. 3, lines 4); and the condition (2) is further defined in that, when the selected sub-tree structure is replaced with the equivalent table to form a new

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data structure, a necessary amount of memory for the new data structure is smaller than that for the assumed tree structure, (col. 2, lines 65-col. 3, lines 4).

As to claims 8, 11, 15, and 23, Ahn further discloses wherein a decision on whether the condition (1) is satisfied is made depending on whether the following equation is satisfied: $ND < NL \times K = Te/Tn$, where Nd is the number of items of data included in the selected sub-tree structure, Nl is the number of levels of the selected node or lower in the assumed tree structure, Tn is search time per node, and Te is search time per entry in the equivalent table, (col. 2, lines 65-col. 3, lines 4).

With respect to claims 9 and 13: an apparatus: see analyzed of claim 6.

With respect to claim 12, Ahn further discloses a memory storing a data structure in which items of data from an assumed tree structure that includes all of the items of data are stored for search, (col. 6, lines 1-4, the computer memory) the data structure comprising: a tree structure in which the items of data are stored except for a portion of the items of data corresponding to a sub-tree of the assumed tree structure, which is a selection portion of an assumed tree structure, (col. 2, lines 56-60); a search section for searching the data structure for an item of data matching input search data, (col. 4, lines 4-46). Ahn discloses a group tree contain plurality of nodes pointer to group index table; however, Ahn does not clearly teach "an equivalent table storing the selected portion of the items of data in table form". Ahn shows each node has a value and two branches,

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where the left branch is less than the value, and the right branch is greater than the value. Each node also stores one or more pointers to the group index table 204, (col. 2, lines 65-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the group index table taught in Ahn, so the system is capable of searching through individual documents, or groups of documents, and the system can locate one or more hit entries in a group hits table associated with a keyword in a search request.

With respect to claim 16, Ahn discloses a tree structure in which the items of data are stored, (col. 2, lines 56-60, each node also stores one or more pointer to the group index table 204) except for a portion of the items of data corresponding to a sub-tree structure, which is a selected portion of an assumed tree structure formed by all the items of data, (col. 2, lines 56-60, in fig. 2, group tree 202). Ahn discloses a group tree contain plurality of nodes pointer to group index table; however, Ahn does not clearly teach "an equivalent table storing the select portion of the items of data in table form". Ahn shows each node has a value and two branches, where the left branch is less than the value, and the right branch is greater than the value. Each node also stores one or more pointers to the group index table 204, (col. 2, lines 65-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the group index table taught in Ahn, so the system is capable of searching through individual documents, or groups of documents, and the system can locate one or more hit entries in a group hits table associated with a keyword in a search request.

As to claim 17, Ahn further discloses wherein the tree structure includes a plurality of nodes, each of which is composed of a node information flag, a plurality of pointers each corresponding to predetermined branches, and related information, wherein each of the pointer indicates one of its child node, the equivalent table, and null, (see fig. 2), and the equivalent table includes a plurality of entries, each of which is composed of a table node information flag, a tail entry flag, a data bit string, a search bit length, and related information, (col. 3, lines 19-23, the database administrators predetermined the information or the values to be stored in the table).

As to claim 18, Ahn further discloses wherein the data bit string is arranged so that a length of the data bit string is equal to that of search data, wherein the search bit length indicates a length of an original data bit string to match with the search data, (col. 3, lines 24-29).

As to claim 19, Ahn further discloses wherein the entries in the equivalent table are stored at consecutive locations in memory, (fig. 2, group table 204).

As to claim 20, Ahn further discloses an amount of memory required to store the data structure is smaller than that required to store the assumed tree structure, (col. 2, lines 56-60); and search performance of the data structure is not lower than that of the assumed tree structure, (col. 2, lines 65-col. 3, lines 4).

As to claims 24-27, and 29, Ahn further discloses wherein the predetermined conditions are that: 1) an amount of memory required to store a data structure including the equivalent table in place of the selected sub-tree structure is smaller than that required to store the assumed tree structure, (col. 2, lines 56-68); and 2) search performance of the data structure is not lower than that of the assumed tree structure, (col. 2, lines 56-68).

With respect to claim 28, the subject matter of claim 28 is rejected in the analysis above claim 6. Therefore, claim 28 is also rejected for the same reasons as given in claim 6.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Contact Information

7. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks


Washington, D.C. 20231

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam V Nguyen whose telephone number is (703) 305-3735. The examiner can normally be reached on 7:30AM-5: 00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Yen Vu can be reached on (703) 305-4393. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for formal communications and (703) 746-7240 for informal communications.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, Virginia 22202. Fourth Floor (Receptionist).

8. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.


SHAHID ALAM
PRIMARY EXAMINER